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Stemonaria fuscoides (*Stemonitaceae, Myxomycetes*): a new record for Brazil

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Abstract — Studies are being carried out in Brazilian mangroves with the aim of contributing to the knowledge of myxomycetes from ecosystems associated with the Atlantic forest. A total of 330 moist chamber cultures were prepared with aerial litter, ground litter, tree bark, and small woody twigs of *Conocarpus erectus* (*Combretaceae*), *Rhizophora mangle* (*Rhizophoraceae*), and *Acrostichum aureum* (*Polypodiaceae*). Four specimens of *Stemonaria fuscoides* were obtained from the cultures prepared with *R. mangle* and *C. erectus*. Previously, *Stemonaria* was represented in Brazil only by *S. longa*, cited for the North (Amazonas State), Northeast (Bahia, Pernambuco, Ceará and Piauí States), Southeast (Rio de Janeiro and São Paulo States), and South (Paraná State), and *S. irregularis*, cited for the states of Ceará and Pernambuco. *Stemonaria fuscoides* is recorded for the first time for the Neotropics and in a mangrove environment.

Key words — *Stemonitales*, taxonomy, myxobiota

Introduction

The family *Stemonitaceae* includes 16 genera, of which *Stemonitis* Gled. and *Comatricha* Preuss are cited most often in the literature. *Stemonaria* Nann.-Bremek. et al. was proposed to accommodate those species in the family that were not well placed in *Stemonitis*, *Comatricha*, *Stemonitopsis* (Nann.-Bremek.) Nann.-Bremek., or *Symphytocarpus* Ing. & Nann.-Bremek., despite having some characteristics in common with these genera (Nannenga-Bremekamp et al. 1984).

Species of *Stemonaria* differ from those placed in the genus *Comatricha* because of the longitudinally rigid, fibrous, or homogeneous construction of the

stipe and columella. *Stemonaria* species can be distinguished from *Stemonitis* due to the absence of a peripheral capillitial net, from *Stemonitopsis* because of the above mentioned structures and absence of a partial peripheral capillitial net, and from *Symphytocarpus* because they are distinctly stipitate and do not form pseudoaethalia (Nannenga-Bremekamp et al. 1984). When proposing the new taxa, Nannenga-Bremekamp et al. (1984) created a key with the aim of aiding in the identification of the species classified as *Stemonaria*. Of the nine species treated, six were described as new to science and three — *Comatricha irregularis* Rex, *Comatricha nannengae* T. N. Lakh. & Mukerji, *Comatricha longa* Peck — were transferred from *Comatricha* because they did not have a fibrous stipe. Between 1987 and 1995, the same authors described five new *Stemonaria* species, four from Japan and another (*S. argentella* Y. Yamam.) from Nepal.

The 14 species that presently comprise the genus have known distributional patterns for both hemispheres, and *Stemonaria longa* (Peck) Nann.-Bremek. et al., *S. irregularis* (Rex) Nann.-Bremek. et al., and *S. gracilis* Nann.-Bremek. & Y. Yamam. have been reported previously for the Neotropics (Farr 1976, Lado 2001, Hernández-Crespo & Lado 2005, Basanta et al. 2008, Lado & Basanta 2008).

Stemonaria irregularis and *S. longa* are a known part of the Brazilian myxomycete biota. The former is known only from the northeastern region and the latter has been reported from several different regions of the country (Cavalcanti 2002, Maimoni-Rodella 2002, Putzke 2002). This paper reports *S. fuscoides* Nann.-Brem. & Y. Yamam. for the first time for Brazil, where it was found associated with substrates derived from two species of mangroves on the southern coast of the state of Pernambuco.

Materials and methods

Samples of the litter and bark of living *Rhizophora mangle* L. (*Rhizophoraceae*) trees were collected from the Nossa Senhora do Ó mangrove forest, located in the municipality of Ipojuca (8° 24'S and 35° 03' 45"W), 50.2 km south of the city of Recife, Pernambuco. Part of the Ipojuca River drainage basin, this area has a hot and humid climate, an average annual temperature of 26.1ºC, and Atlantic Forest vegetation, with its associated ecosystems, mangroves and restingas, a typical formation that occurs in Brazilian coast (CPMR/FIDEM 1998, CONDEPE/FIDEM 2005).

The municipality of Rio Formoso (8º 37'–8º 41'S and 35º 04'–35º 08' W) is 76 km south of Recife and approximately 4 km north of Tamandaré Bay (Lira & Fonseca 1980, FIDEM 1987). Samples of *Acrostichum aureum* L. (*Polypodiaceae*) fronds and aerial litter, ground litter, bark of living trees and small woody twigs of *Conocarpus erectus* L. (*Combretaceae*) were collected from the mangrove

forest located in the Formoso River estuary, which is 12 km long and is formed by contributions of the Formoso, dos Passos, Lemenho, and Ariquindá rivers.

The substrates obtained were used to prepare 330 moist chamber cultures (Novozhilov et al. 2000), which were kept at room temperature and under diffuse light conditions; the cultures were observed weekly during three consecutive months in order to record the presence of myxomycete plasmodia and/or sporocarps. After being stored for 16 months and 24 days, 141 of the cultures prepared with Nossa Senhora do Ó mangrove substrates were once again hydrated and observed for another three months.

The *Stemonaria* sporocarps obtained from these cultures were analyzed, and identified (Farr 1976, Nannenga-Bremekamp et al. 1984) and the collections were deposited in the UFP herbarium (Recife-PE) under numbers 50.314, 50.318, 50.326, and 50.563.

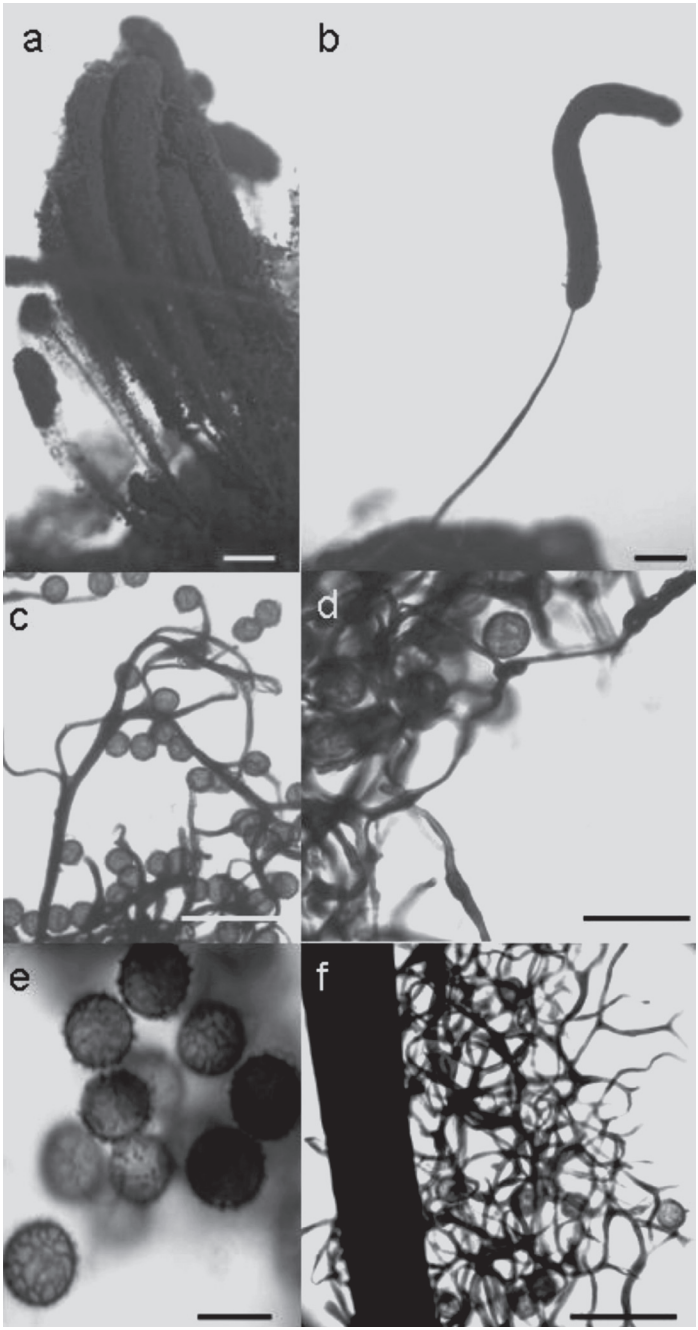
Results and discussion

Half (50.35%) of the moist chamber cultures prepared with N. S. do Ó mangrove material were positive, and three of those containing the bark of living *R. mangle* trees as a substrate produced *Stemonaria* sporangia, which were distributed in groups in one of them and sparsely in the other two. Similar sporangia were also observed in one of the 112 positive cultures prepared with substrates from the Rio Formoso mangrove forest after seven months.

The sporangia, which are linked by a common brilliant, dark brown hypothallus, are 1.7–4.5 mm in total height and have cylindrical, reddish brown stipes (Fig. 1a–b). The sporothecae are cylindrical, brown, 0.2–0.3 mm in diameter, and each has a subcylindrical columella that narrows as it approaches the apex, close to which it splits into two branches (Fig. 1b–c). The capillitium is brown and its filaments have several dark brown expansions characterized by the presence of bulbs or nodules (Fig. 1d & f) that are anastomosed but do not form a net. The spores are pale brown, 9–10 μm in diameter, and ornamented by spines that form complete reticulation in at least one of the hemispheres (Fig. 1d–e).

When comparing the characteristics of the mangrove specimens with the description of *S. fuscoides* presented by Nannenga-Bremekamp et al. (1984), there are differences only with respect to the slightly smaller total height and diameter of the sporocarps and stipe, with the remaining characters typical of the species.

The sporocarps of the collection incubated in the moist chambers prepared using litter from the Rio Formoso mangrove forest have all of the characteristics of var. *longipes* (Fig. 1b) as described by Yamamoto & Nannenga-Bremekamp (1995). They differ from the type variety only in the stalk length, which reaches up to 50% of the total sporocarp height.


a
b
c
d
e
f

Until now, the genus *Stemonaria* was represented in Brazil only by *S. longa* (as *Comatricha longa*) for the North (Amazonas), Northeast (Bahia, Pernambuco, Ceará, Piauí), Southeast (Rio de Janeiro, São Paulo), and South (Paraná) and by *S. irregularis* (as *Comatricha irregularis*) for the states of Ceará and Pernambuco (Torrend 1915, 1916; Farr 1960; Cavalcanti 1976, 2002; Gottsberger et al. 1992; Hochgesand & Gottsberger 1996; Putzke 1996, 2002; Cavalcanti & Putzke 1998; Mobin & Cavalcanti 1999; Maimoni-Rodella 2002). *Stemonaria longa* was found both in urban environments and in humid forests of the northern, northeastern, and southern parts of the country, while *S. irregularis* has been recorded only for humid forest environments in the Northeast. As such, this is the first record of *S. fuscoides* for Brazil and for the Neotropics (Lado & Basanta 2008).

Reports of members of the *Stemonitaceae* associated with mangroves are rare, despite the fact that species in this group of myxomycetes occupy many of the microhabitats potentially available in different ecosystems throughout the world. For example, Nieves-Rivera & Stephenson (2004) reported the occurrence of *Stemonitis splendens* Rostaf. on *R. mangle* for Puerto Rico. Similarly, in the two papers that provide information on the presence of myxomycetes in Brazilian mangroves, Bezerra et al. (1999) and Cavalcanti et al. (2000) recorded the presence of *Comatricha* sp. on *R. mangle* and *Collaria arcyrionema* (Rostaf.) Nann.-Bremek. on *Laguncularia racemosa* (L.) C.F. Gaertn. (*Combretaceae*). Likewise, in a recent study carried out in a mangrove forest in the state of Santa Catarina, southern Brazil, Trierveiler-Pereira et al. (2008) reported that six species of myxomycetes were collected directly in the field from the bark of the trunk of *Avicennia schaueriana* Stapf & Leechm. ex Moldenke (*Avicenniaceae*); two of these were identified as *Stemonitis fusca* Roth and *S. splendens*. No reports are known of the occurrence of *Stemonaria* in this kind of environment. Therefore, the findings from Pernambuco are the first record for this genus in mangroves at world level.

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Fig. 1. a. *Stemonaria fuscoides* (= 0.5 mm); **b.** *Stemonaria fuscoides,* sporocarps with the characteristics of the var. *longipes* (= 0.5 mm); **c.** Bifurcate columella (= 50 µm); **d.** Presence of nodules in the capillitium (= 50 µm); **e.** Spinulose spores with reticulations (= 10 µm); **f.** Capillitium and columella (= 50 µm).

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